

Remarks/Arguments:

This is in response to the Official Action dated October 19, 2004, in which all the claims (21 - 41) previously presented were rejected as obvious over York in view of Ishikawa and, in the case of claims 25, 26, 28, 36 and 40, other references of record.

We have amended the claims above to more clearly distinguish the invention from the prior art. The amended claim 21 includes the features of the originally filed claim 1 and other features supported by the drawings and the description, particularly at page 5, line 1. Reconsideration of the application is respectfully requested.

An important aspect of the present invention is that it combines the advantages offered by electronic solid state switch technology with the compact and standardized external shape of typical known electromechanical switches, in such a way that the latter can be readily replaced by the switch of the invention without modifying the existing electrical cabinet. This way, the installer does not see any difference between the old electromechanical switch and the solid state switch of the invention. This is made possible by providing a single electronic solid state switch for each switching system. The reduced thickness of the structure so obtained is particularly important in naval applications, where the space for the electrical cabinet is very small.

For achieving such a compact structure, copper supports shaped for dissipating heat have been used. In fact, the system structure must be adapted to support a solid state switch for current up to 100 Amperes.

The claimed system structure is not disclosed by Ishikawa (US 4,801,828), nor is it obvious therefrom. Ishikawa discloses an electronic solid state switch where a plurality of thyristors with respective input/output terminals are mounted on three printed circuit boards arranged in a stack. This results in the casing shown in Figures

1 and 2.

Apart from the fact that the thyristors are not suitable for switching DC voltages and the skilled person, facing the problem of finding a suitable casing for a DC solid state circuit breaker, would not look at the contactor of Ishikawa, such arrangement is an example of the common practice of mounting a plurality of switches, for example for different currents, in the same casing on one or more circuit boards. These systems are cost-saving for the manufacturer, but have the drawback that, when there is a fault or failure, the user has to replace or repair the whole casing. Furthermore, the casings have large dimensions, are sensitive to vibrations and have high installation costs due to their complex wiring.

The system of the invention goes in the opposite direction. It has the small standard size of a traditional fuse and simulates such a traditional device with respect to installation and the way it works. If a fault occurs, only the damaged module has to be replaced, and thus only one switch is discarded.

Nevertheless, the system of the invention is still competitive in terms of cost since its structure remains the same regardless the current flowing therein. This is possible because the physical structure is dimensioned for supporting a very heavy duty electronic switch (up to 100 Amperes).

Neither York nor Ishikawa, even in combination with the other references of record discloses or suggests the combination of limitations now recited in claim 21, in particular:

“the single electronic solid state switch is directly electrically connected to the first copper support,

the single electronic solid state switch has input terminals connected to the printed circuit board,

the single electronic solid state switch has output terminals connected to the second copper support,

the printed circuit board has the standard size of a mechanical fuse, and

the printed circuit board and the first and the second copper supports are arranged in such a way the system presents a substantially flat or planar structure”.

We conclude that the present invention is both novel and non-obvious not only for its claimed system structure, which is neither disclosed nor suggested in any of the prior art documents, but also for having solved the problem of replacing traditional electromechanical switches for DC voltage with electronic solid state switches in a way opposite the teachings of the prior art.

A petition for an extension of time accompanies this request.

Respectfully submitted,



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I certify that this correspondence is being transmitted to the Patent and Trademark Office on March 21, 2005 by first-class mailing via the USPS in an envelope addressed to the Commissioner for Patents, Alexandria, Virginia 22313-1450.

